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Labour Economics 14 (2007) 971–986
LABOUR ECONOMICS
www.elsevier.com/locate/econbase

The risk-return trade-off in human capital investment ☆

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Received 31 January 2006; received in revised form 22 May 2007; accepted 5 June 2007
Available online 15 June 2007

Abstract

In this paper, we analyze investments in human capital in a way which is standard for financial assets, but not (yet) for human capital assets. We study mean-variance plots of human capital assets. We compare the properties of human capital returns using a performance measure and by using tests for mean-variance spanning. Fields differ strongly not only in common rates of return, but also in return per unit of risk. We identify a range of educations that are efficient in terms of investment goods, and a range of educations that may be chosen for consumption purposes.

JEL classification: I21; J24
Keywords: Educational Choice; Efficient Frontier; Human Capital Investment; Mean-Variance Analysis

☆ We thank the Danish Research Agency and *CREATES* (funded by the Danish National Research Foundation) for financial support. We appreciate useful comments from two anonymous referees, the guest editor (Joop Hartog), Martin Browning, Alan Manning, Annette Vissing-Jørgensen, and Nina Smith, as well as from conference participants at ESPE, EALE, at the workshop 'Education as a Risky Asset' in Aarhus, at the IZA/University of Amsterdam Workshop 'Schooling and Risk', at seminars at the Aarhus School of Business (Dept. of Finance and Dept. of Economics), at University of Aarhus, and at University of Copenhagen. The usual disclaimer applies.
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doi:10.1016/j.labeco.2007.06.001

1. Introduction

Since the human capital revolution around 1970, economists have viewed education as both investment and consumption. The standard approach assumes that the individual invests an amount of time in education, and then the return shows up in terms of enhanced future earnings, cf. Becker (1993). Hence, two individuals with identical abilities and borrowing opportunities would choose identical levels of education. We extend this standard approach by allowing the individual to choose between different educations (of varying level and field) leading to future income streams with different properties in terms of means, variances, and covariances with the stochastic discount factor. We denote these different investments *human capital assets*. Hence, two individuals with identical abilities and borrowing opportunities might choose different educations if they differ in terms of utility over risk and return.

Relatively little is known about the properties of human capital returns despite the vast amount of evidence showing the importance of human capital to the structure and evolution of earnings, employment and economic growth, cf. Becker (1993). On top of that, human capital has a dominant position in the aggregate wealth portfolio. Becker (1993) estimates the value of human capital to be three to four times the value of financial assets. While financial assets are concentrated in the portfolios of the few (cf. Haliassos and Bertaut, 1995; Christiansen, Joensen and Rangvid, 2005), human capital assets are held by all individuals, and even large changes in the market value of financial assets are unlikely to affect the human capital investment decisions of most individuals, cf. Becker (1993). In this paper, we focus on the human capital market separately from financial markets in order to compare the risk-return properties of various human capital assets.

Only few papers investigate human capital investments in a fashion similar to ours. Palacios-Huerta (2006) finds that frictions in human capital markets help explain the risk-adjusted return on human capital. Palacios-Huerta (2003) uses mean-variance spanning tests to compare the properties of returns to various human capital assets. Thus, he compares the efficient frontier in the mean-variance space spanned by a subset of assets to that spanned by all assets to evaluate whether the return per unit of risk would be more favorable had the choice set been larger.

The human capital market consists of a wide range of human capital assets. Each individual chooses the asset that matches the preferred combination of risk and return of future income. Our dataset comprises 104 different human capital assets that cover a matrix of fields (e.g. economics) and levels (e.g. MA). We use two different variance measures. The mean-variance plots provide valuable information as to which educations are efficient investment goods, and which educations seem to be chosen for other reasons or are related to relatively larger market frictions. To our knowledge, such mean-variance plots are new to the field of labor economics. We corroborate our findings by testing whether the mean-variance frontiers spanned by different sets of assets coincide. We find that fields differ strongly not only in common rates of return, but also in return per unit of risk.

The remaining part of the paper is organized as follows. Section 2 presents our approach to the analysis of the risk-return trade-off. Section 3 presents the empirical analysis. Section 4 concludes the paper.

2. Modeling Risk-Return Trade-Off

2.1. Traditional Labor Economics Approach

It is not standard to consider risk in studies of return to human capital investments. The sparse empirical evidence supports that risk is compensated resulting in a positive risk-return trade-off.